What is claimed is:

1. An electronic device comprising:

at least two contacts; and

a monolayer of conductive organic material forming a conductive path between said contacts, wherein said conductive path includes at least one electron withdrawing group.

2. The device of claim 1, wherein said device exhibits high and low conductivity states.

3. The device of claim 2, wherein said device is repeatedly switchable between said high and said low conductivity states.

4. The device of claim 2, wherein said low conductivity state has a current of less than about 100 pA.

5. The device of claim 4, wherein said low conductivity state has a current of less than about 1 pA.

6. The device of claim 2, wherein said high conductivity state has a current at least about 200 times higher than said low conductivity state.

7. The device of claim 6, wherein said high conductivity state has a current at least about 500 times higher than said low conductivity state.

8. The device of claim 7, wherein said high conductivity state has a current at least about 1000 times higher than said low conductivity state.

9. The device of claim 1, wherein said electron withdrawing group is selected from the group consisting of cyano, isocyano, nitro, sulfonyl, β-carboxyvinyl, sulfinyl, β,β-dicyanovinyl, halogenated alkyl, formyl, carboxyl, carbonyl, alkyloxycarbonyl and aryloxycarbonyl, 1-tetrazolyl, 5-chloro-1-tetrazolyl, carbamoyl, and sulfamoyl.

10. The device of claim 9, wherein said electron withdrawing group is selected from the group consisting of cyano, isocyano and nitro.

11. The device of claim 1, wherein said electron withdrawing group is bonded to a phenyl ring in the conductive path.

12. The device of claim 1, further comprising at least one electron donating group.

13. The device of claim 1, wherein said conductive path comprises atoms, at least 70% of said atoms being sp- or sp^2-hybridized atoms.

14. The device of claim 1, wherein said conductive path comprises alternating ethynyl and aryl groups.

15. The device of claim 14, wherein said conductive path comprises at least one phenyl-ethynyl linkage.

16. The device of claim 15, wherein at least one of said phenyl groups is substituted with an electron withdrawing group.

17. The device of claim 1, wherein said conductive path further comprises binding groups which bind said conductive path to said contacts.

18. The device of claim 17, wherein said binding groups are selected from the group consisting of sulfur atoms, oxygen atoms, cyano, carboxy, diazonium salt, halide, isocyano, phosphine, and tellurium and selenium atoms.

19. The device of claim 1, wherein said conductive path comprises biphenyl groups.

20. The device of claim 1, wherein said conductive path comprises ethenyl groups.

21. An electronic device comprising:

two contacts, wherein at least one contact is a palladium contact; and

a self-assembled monolayer of a conductive organic molecule comprising a phenyl-ethynyl-substituted phenyl-ethynyl-phenyl linkage between said contacts, wherein said substituted phenyl includes at least one nitro group, and wherein said organic molecule is bonded to said palladium contact by at least one isocyano group on a terminal phenyl of said linkage.

22. A memory circuit comprising:

a) an input;

b) an output;

c) a molecular electronic device, said device comprising: at least two contacts; and a monolayer of conductive organic material forming a conductive path between said contacts, wherein said conductive path includes at least one electron withdrawing group, wherein one contact bridges said input and said output, and wherein another

contact is grounded; and

d) a comparator bridging said input and said output, wherein said comparator is in electrical communication with a reference voltage.

23. A memory array comprising a plurality of memory circuits of claim 22, wherein said memory circuits are arranged in an addressable array.

24. A static random access memory cell comprising: at least a first and a second molecular electronic device, each of said devices comprising: at least two contacts; and a monolayer of conductive organic material forming a conductive path between said contacts, wherein said conductive path includes at least one electron withdrawing group, wherein said first device has a contact connected to a reference voltage, and another contact connected to a node, wherein said second device has one contact connected to ground, and another contact connected to said node, and wherein said node is further connected to ground.

25. The memory cell of claim 24, wherein said cell further comprises a gain component.

26. The device of claim 1, wherein the device exhibits negative differential resistance at room temperature.